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Soviet Abstr.
No. 43 No. 5
pp. 10, 123
Organic Chemistry

Some new alicyclic isomers of aromatic hydrocarbons.

A. A. Petrov and N. P. Sopov (Leningrad Inst. Aviation In-
strument Construction). J. Gen. Chem. U.S.S.R. 22,
819-83 (1952) (Engl. translation).—See C.A. 47, 5171g.

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[Conjugated systems. XI V. Condensation of dieno-
hydrocarbons with esters of malic and fumaric acids. A. A.
Pruzin and N. P. Sopov (Leningrad Inst. Aviation Instru-
ment). *Soviet Obshch. Khim.* 2, 833-84 (1953);
Zh. 47, 8374; 49, 8301.—Equimolar mixts. of the dienes
and the esters (0.1 mole each) were heated in 30 ml. MePh in
sealed tubes 16-20 hrs. to 150-60°. Di-Me maleate ^{1/3} b.p.
101-1.6°, n_{D}^{20} 1.1504, n_{D}^{25} 1.4432; di-Et ester, b.p. 101.5-1.7°,
b.p. 110.5-116.7°, n_{D}^{20} 1.0690, n_{D}^{25} 1.4116. Di-Me fumarate
m. 101-2°; di-Et ester, b.p. 97.5-7.7°, d₄ 1.0512, n_{D}^{25} 1.4420;
b.p. 111.5-11.7°. Their reactions with butadiene, piperylene,
and crude 2,4-hexadiene gave the following products (the
acids were obtained by hydrolysis of the esters). Di-Me
cis-hexene-1,5-dicarboxylate, *cis* form, 68.5%, b. 141.6-2°,
d₄ 1.1450, n_{D}^{20} 1.4733; free acid, m. 160°; *trans* isomer,
d₄ 1.1450, n_{D}^{20} 1.4733; free acid, m. 160°; n_{D}^{25} 1.4682;
di-Me ester, 83.0%, b. 139.9.5°, d₄ 1.1272, n_{D}^{25} 1.4682;
free acid, m. 160°; *cis*-isomer, di-Et ester, 61%, b. 153-4°;
free acid, m. 160°; n_{D}^{20} 1.4733; *trans* isomer, 59.4%, b. 150.5-1.5°;
d₄ 1.0843, n_{D}^{25} 1.4733; anhydride of the *cis* acid, m. 103-4°;
d₄ 1.0639, n_{D}^{20} 1.4552;

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that of the *trans* form, m. 155.5-6.5°. Di-Me 1-methylcyclohexene-4,5-dicarboxylate, *cis* form, 84.3%, b. 149.5-56°, *trans* form, 1.111, n_D^{20} 1.4733; *trans* form, 48.9%, b. 149-9.5°, d₄₀ 1.1101, n_D^{20} 1.4704; free acid, *cis* form, m. 161.5-2.5°, *trans* form, m. 163-4°; anhydrides of the *cis* acid, m. 68°; that of the *trans* form, m. 141-2°. Di-Me 3-methylcyclohexene-4,5-dicarboxylate, *cis* form, 84.5%, b. 144-5°, d₄₀ 1.1101, n_D^{20} 1.4703; *trans* form, 40.7%, b. 143.5-1°, d₄₀ 1.0977, n_D^{20} 1.4972. Di-Me 1,2-dimethylcyclohexane-4,5-dicarboxylate, *cis* form, 83%, b. 157-7.5°, d₄₀ 1.0993, n_D^{20} 1.4778; *trans* form, 80.1%, b. 159.5-60.5°, m. 55°; free acid, *cis* form, m. 178-80°; *trans* form, m. 213-15°; anhydride, *cis* form, m. 78°, *trans* form, m. 150-7°. Di-Me 3,6-dimethyl-4,5-hexene-1,5-dicarboxylate, *cis* form, 58.2%, b. 151.5-3.5°, d₄₀ 1.0900, n_D^{20} 1.4740; *trans* form, 52%, b. 160.5-1.5°, d₄₀ 1.0892, n_D^{20} 1.4704. Di-Me 3,6-endioctadiene-1,5-dicarboxylate, *cis* form, 49.8%, m. 70-70.6°; *trans* form, 29.6%, m. 26-7°. XI, VI. Condensation of alkoxyprenes with esters of maleic and fumaric acids. Ibid. 869-1—Condensation of esters of maleic or fumaric acid with alkoxyprenes was run in sealed tubes at 150-60° 15-20 hr.

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The esters were hydrolyzed to the acids in 10% NaOH. Treatment of the esters with 25% H₂SO₄ gave the β -cyclohexanone dicarboxylates. These were obtained: *Di-Me* *1-methoxycyclohexene-4,5-dicarboxylate, cis form*, b.p. 173°, d₄ 1.1781, n_D²⁰ 1.4708; *trans isomer, m. 87-89°, b.p. 169.5-70°*. *Di-Me* *1-ethoxycyclohexene-4,5-dicarboxylate, cis form, b.p. 178-8.5°, d₄ 1.1426, n_D²⁰ 1.4768; trans form, b.p. 170-6.5°, d₄ 1.1160, n_D²⁰ 1.4735.* *Di-Et* *1-methoxycyclohexene-4,5-dicarboxylate, cis form, b.p. 182.5-3°, d₄ 1.1110, n_D²⁰ 1.4701; trans form, b.p. 151.5-2°, b.p. 1.1001, n_D²⁰ 1.4672.* *Di-Et* *1-ethoxycyclohexene-4,5-dicarboxylate, cis form, b.p. 187-7.5°, d₄ 1.0975, n_D²⁰ 1.4684; trans form, b.p. 186°, d₄ 1.0785, n_D²⁰ 1.4654.* *Di-Me* *cyclohexanone-3,4-dicarboxylate, cis form, b.p. 185.5-6.5°, d₄ 1.2116, n_D²⁰ 1.4740; trans form, m. 84.5-5.5°; their anhydrides, m. 138-9° and 174-5°, resp.* *Di-Et* *cyclohexanone-3,4-dicarboxylate, cis form, b.p. 164.5-5.5°, d₄ 1.1374, n_D²⁰ 1.4646; trans form, b.p. 191-2°, d₄ 1.1264, n_D²⁰ 1.4539.* *Cyclohexanone-3,4-dicarboxylic acid, cis form, m. 167°; trans form, m. 138-90°.* G. M. K.

SOPOV, N. P. and PETROV, A. A.

Studies of Conjugated Systems. XLVI. Condensation of Alkoxprenes with
Esters of Maleic and Fumaric Acid, page 860, Abornik statey po obshchey
khimii (Collection of Papers on General Chemistry), Vol II, Moscow-
Leningrad, 1953, pages 1680-1686.

Chemistry Laboratory, Leningrad, Inst of Aviation Building

PETROV, A.A.; SOPOV, N.P.

Conjugated systems. Part 47. Condensation of butynone with cyclic diene
hydrocarbons. Zhur. ob. khim. 23 no.6:1034-1038 '53. (MLRA 6:6)

1. Khimicheskaya laboratoriya Leningradskogo instituta aviationsonnogo pri-
borostroyeniya.
(Diene compounds) (Butynone)

USSR:

✓Conjugated systems. XLVII. Condensation of buty-
P. Sopov. J. Gen. Chem. U.S.S.R. 23, 1035-9 (1953).
(Partial translation). XLVIII. The order of addition of
alkyl hypodites to homologs of chloroprene. A. A. Petrov
and E. A. Leporskaya. Ibid. 1091-8. —See C.A. 48,
8181h.

Sopov, N. P.

USSR/Chemistry - Conversion processes

Card 1/1 Pub. 151 - 21/38

Authors : Petrov, A. A., and Sopov, N. P.

Title : Conversion of hydroaromatic aldehydes and ketones into aromatic hydrocarbons during dehydration

Periodical : Zhur. ob. khim. 24/2, 298-302, Feb 1954

Abstract : The dehydration of hydroaromatic substances having two double bonds and the oxygen atom in the side chain in alpha-position relative to the ring was investigated to determine the possibility of their conversion into aromatic hydrocarbons. It was found that during the distillation with P_2O_5 or with Al_2O_3 at 350-400° the unsaturated hydroaromatic ketones and in the case of P_2O_5 also the aldehydes, which form during the condensation of the diene hydrocarbons and their derivatives with alpha,beta-unsaturated aldehydes and ketones of the fatty series, easily submit to dehydration forming various aromatic compounds. Fifteen references: 7-USSR; 4-USA; 1-French and 3-German (1894-1953).

Institution : Institute of Aviation Instruments, Chemical Laboratory, Leningrad

Submitted : October 2, 1953

Sopov, N.P.

USSR

Transformation of hydroaromatic aldehydes and ketones
into aromatic hydrocarbons by dehydration. A. A. Petrov
and N. P. Sopov. J. Gen. Chem. U.S.S.R. 24, 301-5
(1954) [Engl. translation].—See C.A. 49, 46106. H.L.H.

Sopov, N. P.

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Conjugated systems. LVII. Condensation of prepara-
aldehyde with piperylene and isoprene. A. A. Petrov and
N. P. Sopov (Inst. Aviation Instr., Leningrad). Zhur. CH
Chim. Promst. 25, 817-23 (1958); J. Gen. Chem. U.S.S.R.
25, 485-9 (1955) (Engl. translation); cf. C.A. 50, 233b.—
Condensation of HCl;CCHO with piperylene and isoprene
occurs in the direction expected from electronic polarization
of the reactants. Heating 0.2 g. HCl;CCHO and 16 g.
piperylene (91% pure) in 30 ml. MePh 5 hrs. at 140° gave
*71% 2-methyl-3,5-dihydrobenzaldehyde, b.p. 83-85°, d₄
0.9319, n_D²⁰ 1.6018; semicarbazone, m. 197°; 2,4-dinitro-*
phenylhydrazone, m. 109-70°; p-nitrophenylhydrazone, m.
183-6°. The aldehyde heated with S gave o-MeC₆H₄CHO
(50% yield), while treatment with McMgl gave 87%
*methyl-2-methyl-3,5-dihydrophenylcarbinol, b.p. 104.5°, d₄
0.9008, n_D²⁰ 1.5002, which distd. with 10% (CO₂H)₂ gave*
78% o-MeC₆H₄I, identified by oxidation to phthalic acid.
When the piperylene for the above reaction was obtained by
dehydration of methylpropenylcarbinol with HBr, the re-
sulting aldehyde was able to react with maleic anhydride
and with S, but in the latter case no toluakaldehyde could be
isolated from the tarry product. Possibly some isomeriza-
tion of the double bonds in the dihydro compd. took place.
Similar reaction of 7.6 g. HCl;CCHO with 11.6 g. CH₃;CMe-
CH₂C₆H₅ gave 70.0% 4-methyl-3,5-dihydrobenzaldehyde (I), b.p.
95.5-6°, d₄ 0.9043, n_D²⁰ 1.5121; semicarbazone, m. 202-3°;
p-nitrophenylhydrazone, m. 102-3°; 2,4-dinitrophenylhy-
drazone, m. 214-15°. Heated with S it gave p-MeC₆H₄-
CHO in 60% yield. I with McMgl gave 94% methyl-4-
methyl-3,5-dihydrophenylcarbinol, b.p. 116.5-0.5°, d₄ 0.9088,
n_D²⁰ 1.5008, which with (CO₂H)₂ dehydrated to o-MeC₆H₄I.
G. M. Kondapalli

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SOPOV N. P.

✓ Condensation of diane compounds with methacrylate.
Synthesis of hydroaromatic alcohols and hydrocarbons.
N. P. Sopov (Inst. Aviation Instruments, Leningrad).
Zhur. Obshch. Khim. 25, 2082-90 (1955); cf. *C.A.* 49, 8307.
The following condensations were run in the presence of
hydroquinone in ampuls at 140-60° 12 hrs. (compd.: %
yield and product, b. p., d_{40}° , n_D^{20} given): 1,3-Butadiene
with $\text{CH}_3\text{C}(=\text{O})_2\text{Me}$, 84% $\text{Me}\beta\text{-cyclohexene-1-carboxylate}$,
 b_{10}° 78.0-9.6°, 1.0130, 1.4621; piperylene, 80% $\text{Me}\beta\text{-Methyl-}$
 $\beta\text{-cyclohexen-1-carboxylate}$, b_{10}° 85-6°, 0.9857, 1.4002;
isoprene, 84% $\text{Me}\beta\text{-methyl-}\beta\text{-cyclohexene-1-carboxylate}$, b_{10}°
93-3.5°, 0.9006, 1.4636; dipropenyl, 54% $\text{Me}\beta\text{-2,5-di-}$
 $\text{methyl-}\beta\text{-cyclohexene-1-carboxylate}$, b_{10}° 77°, 0.9776, 1.4628;
diisopropenyl, 39% $\text{Me}\beta\text{-3,4-dimethyl-}\beta\text{-cyclohexene-1-carboxyl-}$
 ate , b_{10}° 105.5-6.5°, 0.9009, 1.4722; cyclopentadiene, 78% Me
 $\beta\text{-endomethyl-}\beta\text{-cyclohexene-1-carboxylate}$, b_{10}° 85-5.5°,
1.0240, 1.4745; cyclohexadiene, 32% $\text{Me}\beta\text{-2,5-endooethylene-}\beta\text{-cy-}$
 $\text{clohexene-1-carboxylate}$, b_{10}° 106-6.5°, 1.0600, 1.4870; chloro-
prene, 40% $\text{Me}\beta\text{-4-chloro-}\beta\text{-cyclohexene-1-carboxylate}$, b_{10}° 116-
10°, 1.1850, 1.4898. These esters (0.1 mole) were treated
with MeMgI from 0.25 g.-atom Mg in Et_2O , yielding 60-65%
of the following corresponding tertiary alics. Me_2CROH (R,
 b_{10}° , d_{40}° , and n_D^{20} given): $\beta\text{-cyclohexen-1-yl}$, 95-0°, 0.9180,
1.4828; 2-methyl- $\beta\text{-cyclohexen-1-yl}$, 102-3°, 0.9406, 1.4827;
4-methyl- $\beta\text{-cyclohexen-1-yl}$, 110-11°, 0.9344, 1.4822; 2,5-di-
methyl- $\beta\text{-cyclohexen-1-yl}$, 112-13°, 0.9364, 1.4810; $\beta\text{-4-di-}$

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methyl-3-cyclohexen-1-yl, 120-1°, 0.9380, 1.4881; 3,5-endo-methylene-3-cyclohexen-1-yl, 92-3°, 0.9324, 1.4897; 3,5-endoethylene-3-cyclohexen-1-yl, 113-14°, 1.0020, 1.5060. These heated with 50% excess Ac₂O in sealed tubes 6 hrs. at 200° gave 50-60% of the following hydrocarbons Me, C, R (R, b_{nm}, d_{nm}, and n_D²⁰ given): 3-cyclohexen-1-yldene, 155-8°, 0.8123, 1.4805; 2-methyl-3-cyclohexen-1-yldene, 171-2°, 0.8584, 1.4702; 4-methyl-3-cyclohexen-1-yldene, 178-8°, 0.8493, 1.4830; 2,5-dimethyl-3-cyclohexen-1-yldene, b.p. 92-4°, 0.8575, 1.4800; 2,4-dimethyl-3-cyclohexen-1-yldene, 160-2°, 0.8703, 1.4878; 2,5-endomethylene-3-cyclohexen-1-yldene, b.p. 71-3°, 0.9179, 1.4970. The endoethylene deriv. lost C₂H₄ in this reaction and gave cumene. The hydrocarbons were dehydrogenated over Pt-C at 825-50°, yielding: iso-PrPh, b.p. 152-3°, 0.8688, 1.4885; o-iso-PrC₆H₄Me, b.p. 177-9°, 0.8750, 1.5003; p-isomer, b.p. 175-7°, 0.8868, 1.4932; 2,1,4-iPr₂C₆H₃Me, b.p. 85-8.8°, 0.8609, 1.4944. C. M. K.

SOPOV, N.P.

Preparation of hydroaromatic compounds on the basis of products of
the diene synthesis. Part 4: The action of organomagnesium compounds
on esters of cyclohexene-4-dicarboxylic acids. Zhur. ob. khim. 26 no.6:
1602-1609 Je '56. (MIRA 11:1)

1. Institut aviatsionnogo priborostroyeniya.
(Esters) (Magnesium organic compounds)

SOPOV, N. P.

Preparation of hydroaromatic compounds on the basis of
products of the diene synthesis. IV. Reaction of organo-
magnesium compounds with esters of 4-cyclohexenedicar-
boxylic acids? N. P. Sopov. J. Gen. Chem. U.S.S.R. 26,
1793-1801(1956)(English translation).--See C.A. 51, 18341.
B. M. L.

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SOPOV, N.P.

Condensation of diene hydrocarbons with acetylenedicarboxylic acid and its methyl esters. N. P. Sopov and V. S. Miliashavitsyna
Zh. obshch. Khim., 1954, no. 1914-1915. Condensation of divinyl, pipериле, isoprene and dipropenyl with dimethyl esters of acetylenedicarboxylic acid resulted, in all cases, in separation of dihydropthalic acid. From esters of $\Delta^{1,4}$ -dihydropthalic acid and homologues the corresponding acids and anhydrides were derived. Prep. of dihydropthalic acid and its homologues proceeded more satisfactorily from esters of acetylenedicarboxylic acid than from the acid, as in the latter case decarbonylation and other processes take place. The easiest esters to saponify were those of $\Delta^{1,4}$ -dihydropthalic acid and the most difficult those of 3 : 6-dimethyl- $\Delta^{1,4}$ -dihydropthalic acid. All acids were white crystals of high m.p.; they dissolved slightly in benzene, ethers, CHCl_3 , and cold water and readily in alcohol and boiling water. A. L. B.

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PETROV, A.A.; SOPOV, N.P.

Research in the field of conjugate systems. Part 67. Condensation
of propargylic aldehyde with 2-halo- and 2-alkoxybutadienes. Zhur.
ob.khim. 26 no.9:2452-2457 S '56. (MLRA 9:11)

1. Leningradskiy institut aviationskogo priborostroyeniya.
(Propiolic aldehyde) (Butadiene)

Sopov, N.P.

Conjugated systems. LXXXIII. The order of addition of bromine to vinylacetylene? A. A. Petrov, G. I. Semenov, and N. P. Sopov (Leningrad Technol. Inst., Leningrad). *Zhur. Osnovnoi Khim.* 27, 928-931 (1967); cf. C.A. 51, 15304b.—Addn. of 80 g. Br in CHCl₃ to 54 g. vinylacetylene at -20° gave on fractionation of the products mostly 1,4-dibromo-1,2-butadiene, b.p. 69.5-70.5°, and a lesser amt. of 1,2-dibromo-1,3-butadiene, b.p. 43-6°. The result at -10° was similar to that described earlier (C.A. 44, 7751c). These products were characterized by infrared spectra. Authentic 1-bromo-1,3-butadiene was prep'd. from 1,4-dibromo-2-butene and powd. KOH, b.p. 91-1.5°, n_D²⁰ 1.5160. Addn. of HBr to vinylacetylene in the presence of CuBr gave 2-bromo-1,3-butadiene, b.p. 42°, n_D²⁰ 1.4986. The fraction, b.p. 43-6°, above treated 4 hrs. with cold KOH in MeOH gave pure 1,2-dibromo-1,3-butadiene, b.p. 43-3.5°, n_D²⁰ 1.5804. Vinylacetylene and HCl gave 4-chloro-1,3-butadiene, b.p. 87.5-8°, n_D²⁰ 1.4778. All the above substances were characterized by infrared spectra. Examn. of infrared spectra of the products of bromination of vinylacetylene showed that in addn. to 1,2- and 1,4-dibromobutadienes cited above, the reaction also yields BrCH₂CHBrC₂CH which contaminates both the principal fractions described above. Lowering of the reaction temp. favors the formation of 1,4-dibromo-1,2-butadiene. The infrared spectra of the products are discussed in detail. LXXXIV. Infrared spectra and reactivity of vinylacetylenic hydrocarbons. A. A. Petrov, Yu. I. Porai'eva, and G. I. Semenov. *Ibid.* 1107-74; cf. C.A. 51, 9409. Infrared spectra are shown for: H₃C:CC(CH=CH₂)₂, HC(CCH₂)CHMe, HC(CCH₂)CHBr, HC(CCM₂)CHMe, CH₃C(CMe)₂CH, H₃C:CHC(CMe)=CH₂, H₃C:CHC(CBz)=CH₂, H₃C:CHC(CPr)=CH₂, H₃C:CHC(CBu)=CH₂, and 1-hexen-4-yne. In this group the vinyl group is characterized by frequencies of 3110, 3030, 1608, 1420, 975, and 920 cm.⁻¹, the CH:CH group by 3040, 1620,

Distr: 4E4j/4E2c(j)/4E3d

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Petrov, A.A.; Semenov, G.I. . .

and 955, the CH_2C group by 3105, 1620, 1410 and 908, the terminal acetylenic group by 3300 and 2115, the same group within the chain by about 2250 cm^{-1} . Conjugation displaces the bands toward longer wave-lengths. The intensity of the absorption caused by the unsatd. links agrees with the expected levels of electron displacement caused by the substituent radicals. LXXXV. Reaction of propargyl bromide with aliphatic aldehydes under the conditions of Reformatskii reaction. A. A. Petrov, Yu. I. Porfir'eva, and O. I. Semenov. *Ibid.* 1175-8.—Reaction of propargyl bromide with Zn and aldehydes was run as described earlier by Henbest, et al. (*C.A.* 44, 2934g), but using Et_2O as solvent. Reactions with AcH and EtCHO gave a mixt. of *1-pentyn-4-ol* and *1,3-pentadien-4-ol*, b_{10} 45-6°, b_{10} 61-2°, b_{10} 78-8°, d_{20} 0.9030, n_D^{20} 1.4384; the former was prep'd. in 30% yield from propylene oxide and $\text{HC}\equiv\text{CNa}$ in liquid NH_3 , b_{10} 72.5-3.5°, d_{20} 0.8918, n_D^{20} 1.4388. Propargyl bromide and propargylaldehyde similarly gave *1-hexyn-4-ol* contaminated with *1,2-hexadien-4-ol*, b_{10} 54-5°, b_{10} 71-2°, d_{20} 0.8763, n_D^{20} 1.4416. The alcs. were converted to α -toluenesulfonates which were converted to unsatd. hydrocarbons: *1-pentyn-4-ol* gave *3-penten-1-yne*, b_r 40.5-7.5°, d_{20} 0.7203, n_D^{20} 1.4348, while *1-hexyn-4-ol* gave *3-hexen-1-yne*, b_r 72-4°, d_{20} 0.7425, n_D^{20} 1.4381. Infrared spectra of all products are shown.

G. M. Kosolapoff

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SOPOR, N. P.

Distr: 4E43/4E20(1)/4E3d

Preparation of hydroaromatic hydrocarbons by pyrolysis of acetates of secondary alcohols obtained from products of diene synthesis. A. A. Peletov and N. P. Sopor (Aviation Inst. Construct. Inst., Leningrad). Zhur. Obrabotki Kamen. 27, 1765-805 (1957); cf. C.A. 50, 8497x. -- The following carbocis were prep'd. by previously described technique (C.A. 47, 27354): methyl(3-cyclohexen-1-yl), bp 93-9.5°, d₄ 0.9592, n_D²⁰ 1.4942; ethyl(3-cyclohexen-1-yl), bp 104-4.5°, 0.9593, 1.4832; 73% propyl(3-cyclohexen-1-yl), bp 118.5-14°, 0.9330, 1.4806; 63.3% isopropyl(3-cyclohexen-1-yl), bp 100-7°, 0.9403, 1.4830; 59.5% butyl(3-cyclohexen-1-yl), bp 131.5-2°, 0.9256, 1.4795; 50.6% isobutyl(3-cyclohexen-1-yl), bp 121.5-2.5°, 0.9221, 1.4775; methyl(6-methyl-3-cyclohexen-1-yl), bp 101-1.5°, 0.9465, 1.4822; 58.5% ethyl(6-methyl-3-cyclohexen-1-yl), bp 108.5-9.5°, 0.9406, 1.4830; methyl(2-methyl-3-cyclohexen-1-yl), bp 102-2.5°, 0.9492, 1.4834; ethyl(2-methyl-3-cyclohexen-1-yl), bp 111.5-12°, 0.9400, 1.4830; methyl(4-methyl-3-cyclohexen-1-yl), bp 100.2°, 0.9421, 1.4834; ethyl(4-methyl-3-cyclohexen-1-yl), bp 110.5-17°, 0.9374, 1.4828; methyl(3,5-dimethyl-3-cyclohexen-1-yl), bp 110.5-11.5°, 0.9349, 1.4820; 70.7% ethyl(3,5-dimethyl-3-cyclohexen-1-yl), bp 118-0°, 0.9305, 1.4851; 74.7% methyl(3,4-dimethyl-3-cyclohexen-1-yl), bp 118-19°, 0.9356, 1.4800; ethyl(3,4-dimethyl-3-cyclohexen-1-yl), bp 126-7°, 0.9350, 1.4870; methyl(3,6-endomethylene-3-cyclohexen-1-yl), bp 91.5-2.5°, 1.0012, 1.4936; ethyl(3,5-*cis*-1,5-ethylenes-3-cyclohexen-1-yl), bp 109-10°, 0.9998, 1.5020. The preceding alics. were acetylated with Ac₂O in presence of a drop of H₂SO₄, yielding

6 May
1/3

PETROU, A. A.; SOPOU, N. R.

the respective acetates: δ 101.4-15°, 0.9777, 1.4634; δ 113-14°, 0.9668, 1.4608; δ 121-2°, 0.9659, 1.4600; 54.8%, δ 114-18°, 0.9610, 1.4682; 76%, δ 137.5-34°, 0.9488, 1.4610; 79.1%, δ 129.5-30.5°, 0.9445, 1.4603; 88%, δ 107.5-108°, 0.9605, 1.4612; 68%, δ 118-18.5°, 0.9664, 1.4620; 74%, δ 108-6.5°, 0.9660, 1.4632; 73%, δ 118.5-19.5°, 0.9509, 1.4641; 74.4%, δ 115.5-14.5°, 0.9612, 1.4618; 68.6%, δ 144.5-5.5°, 0.9538, 1.4628; 73.4%, δ 119-20°, 0.9503, 1.4638; δ 126-7°, 0.9628, 1.4600; 67.9%, δ 125.5-6°, 0.9508, 1.4681; 78.4%, δ 134-5°, 0.9624, 1.4718; δ 102-3°, 1.0061, 1.4600; 61.4%, δ 119-30°, 1.0164, 1.4780. The acetates were pyrolyzed at 400-50° by passage through a quartz tube filled with spiral of heat-resistant glass, yielding the following unsaturated compounds: 5-cyclohexen-1- γ -olefin, δ 66.5-7.5°, 0.8308, 1.4648; 67.7% 1-methyl-3-(5-cyclohexen-1- γ)-alkene, δ 91.5-3°, 0.8393, 1.4735; 53.5% 1-propyl-3-(5-cyclohexen-1- γ)-alkene, δ 109.5-10.5°, 0.8418, 1.4740; 42% 1,1-dimethyl-3-(5-cyclohexen-1- γ)-alkene, δ 100-7°, 0.8434, 1.4700; 46.1% 1-propyl-3-(5-cyclohexen-1- γ)-alkene, δ 127-8°, 0.8403, 1.4720; 20.6% 1-isopropyl-3-(5-cyclohexen-1- γ)-alkene, δ 118-19°, 0.8323, 1.4665; 58.2% (6-methyl-3-cyclohexen-1- γ)-alkene, δ 79-80°, 0.8203, 1.4658; 1-methyl-3-(6-methyl-5-cyclohexen-1- γ)-alkene, δ 100-4°, 0.8374, 1.4718; 66.6% (8-methyl-5-cyclohexen-1- γ)-alkene, δ 89-6°, 0.8364, 1.4702; 65.6% 1-(3-methyl-3-cyclohexen-1- γ)-3-methyl-alkene, δ 101.5-3.5°, 0.8390, 1.4748; 57% (4-methyl-5-cyclohexen-1- γ)-alkene, δ 87-90°, 0.8320, 1.4715; 79.3% 1-methyl-3-(4-methyl-3-cyclohexen-1- γ)-alkene, δ 1'3-11°, 0.8412, 1.4770; 45.7% (4,6-dimethyl-3-cyclohexen-1- γ)-

6
2/11/4
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2/3

VETROV, A.A.; 601261; N.P.

ethene, b.p. 68-72°, 0.8533, 1.4778; 42.2% 1-methyl-2-(3,5-dimethyl-3-cyclohexen-1-yl)ethene, b.p. 83.5-5°, 0.8008, 1.4822; 59.2% (3,4-dimethyl-3-cyclohexen-1-yl)ethene, b.p. 70.5-1.5°, 0.8408, 1.4785; 64.2% 1-methyl-2-(3,4-dimethyl-3-cyclohexen-1-yl)ethene, b.p. 87-7.5°, 0.8198, 1.4820; 42.3% (2,5-endomethylcyclohexen-1-yl)ethene, b.p. 71-4°, 0.9254, 1.5050. Pyrolysis of methyl(2,5-endomethyl-3-cyclohexen-1-yl)-carbinyl acetate gave an anomalous result, yielding mixed acetates of crotonyl and methylvinylcarbiaryl acetates. Pyrolysis of the acetates over Pt-C at 350° gave mainly the expected aromatic hydrocarbons. The results indicate that diene condensation of acrolein with piperylene yields mixed isomeric aldehydes with predominance of α -isomer; similar reaction with isoprene yields mainly (85%) the β -isomer. This is suggested by the fact that (2-methyl-3-cyclohexen-1-yl)ethene on dehydrogenation over Pt-C gave mainly α -Me-C₆H₅Et with some β -isomer, as evidenced by oxidation mainly to phthalic acid and small amt. of isophthalic acid. Similarly, dehydrogenation of (4-methyl-3-cyclohexen-1-yl)ethene, described above, gave a MeC₆H₅Et which oxidized mainly to terephthalic acid with a small amt. of isophthalic acid.

G. M. Kosolapoff

6
2 May
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3/9

Scp. V.

N. P.

AUTHORS:

Sopov, N. P., and Kovner, A. Z.

77-11-6/56

TITLE:

Condensation of the Diene Compounds ($C_n \cdot C_{n-2}$) with Methyl Acrylate. - Synthesis of Hydroaromatic Alcohols and Hydrocarbons (Kondensatsiya dienovykh soyedinenii s metilmakrilatom. - Sintez gidroaromaticeskikh spirtov i uglevedoregov).

PERIODICAL:

Zhurnal Obshchey Khimii, 1957, Vol. 27, Nr 11, pp. 2936-2941 (USSR).

ABSTRACT:

In earlier published papers in which one of the authors of this article participated it was investigated whether it is possible to obtain trivalent hydroaromatic alcohols and hydrocarbons [1,2] from products of the condensation of 1,3-diene hydrocarbons with methyl acrylate with the aid of organic magnesium compounds. In this connection it was shown that mixtures with extensive boiling temperature are obtained on the action of magnesium methyl iodide upon the methyl esters of alkylcyclohexene carboxylic acids. In the present work the authors made it their object to determine the composition of the mixtures forming in this connection. The tests showed that mixtures of alcohols and ketones develop in reactions of the esters of 1-methylcyclohexene-2-carboxylic acid and its homologues with RMgJ, reaction velocity and relative yield of the alcohols and ketones being dependent on the position and the number of the methyl groups in the ring.

Card 1/2

Condensation of the Diene Compounds (C_nH_{2n-2}) with Methyl Metacrylate. 79-11-6/56
Synthesis of Hydroaromatic Alcohols and Hydrocarbons.

(see table 1).

Thus quite a number of trivalent alcohols and ketones was produced from products of the condensation of methylmetacrylate with divinyl-, piperylene-, isoprene-, dipropenyl-, diisopropenyl-, cyclopentadiene-1,3 and cyclohexadiene-1,3 with the aid of magnesium-methyl iodide and magnesium ethyl iodide. By dehydration of five alcohols the corresponding hydroaromatic hydrocarbons were obtained. Hydrocarbons of the type 1,4-dimethyl-1-isopropenylcyclohexene-3 could not be dehydrated with platinum.

There are 6 tables, and 5 references.

ASSOCIATION: Leningrad Institute of Aircraft Equipment Construction (Leningrads-
kiy institut aviatsionnogo priborostroyeniya).

SUBMITTED: November 1, 1956.

AVAILABLE: Library of Congress.

- Card 2/2
1. Diene compounds-Condensation reactions
 2. Hydroaromatic alcohols-Synthesis
 3. Hydrocarbons-Synthesis
 4. Methylmetacrylate-Condensation reactions

REF ID:

Dov, N. I., Kovner, V. L.

SOV/79-28-3-32/66

TITLE:

Condensation of Diene-Hydrocarbons with Cinnamaldehyde. Synthesis of Hydro-Aromatic Alcohols, Acetates and Hydrocarbons (Kondensatsiya diyenovykh uglevodorodov s korichnym al'degidom. Sintez hidroaromaticeskikh spirtov, etsetatov i uglevodorodov)

PUBL. DETAIL:

Zhurnal obshchey khimii, 1958, Vol. 28, Nr 8, pp. 2147-2151
(USSR)

ABSTRACT:

Continuing their previous investigations (Ref's 1-6), the authors investigated the condensation of divinyl, piperylene, isoprene, diisoprenyl, cyclopentadiene, and cyclohexadiene with cinnamaldehyde. From the aldehydes thus obtained, secondary alcohols, their acetates, and, by pyrolysis of the latter, hydro-aromatic hydrocarbons were synthesized. The constants, analysis data, and yields of 2-phenyltetrahydrobenzaldehyde and its homologues are shown in table 1. The condensation of cyclopentadiene-1,3 with cinnamic acid could not be effected. The phenyltetrahydrobenzaldehydes are viscous, odorless, water-insoluble liquids which are easily soluble in ether, benzene, and alcohol. For all aldehydes,

Card 1/3

107/79-20-3-32/66
Condensation of Diene-Hydrocarbons With Cinnamaldehyde. Synthesis of hydroaromatic alcohols, acetates and Hydrocarbons

p-nitrophenylhydrazone and 2,4-dinitrophenylhydrazone were obtained. Secondary alcohol resulted from the action of methyl magnesium iodide on 2-phenyltetrahydrobenzaldehyde and its homologues. They are even more viscous than the aldehydes. From the alcohol obtained from this aldehyde, two products, one crystalline and one liquid (trans and cis?), were separated out. The constants of the alcohol are shown in table 5. The acetates of these alcohols are less viscous than the alcohols and have their boiling points 4° above those of the latter; they have the same specific gravities, but considerably lower refractive indices. The hydroaromatic hydrocarbons were obtained by pyrolysis of the acetates. On the basis of criteria established on an earlier occasion the resulting products were given the formulae specified in table 5 (Refs 11-15). There are 5 tables and 15 references, 8 of which are Soviet.

Fig 2/3

2047/1-10-3-32/66

The Reaction of Benzene-Hydrocarbons with Cinnamaldehyde. Synthesis of Hydroxylic Alcohols, Acetates and Hydrocarbons

INSTITUTION: Leningradskiy institut vystavionnogo priborostroeniya
(Leningrad Institute of Aircraft Instruments and Equipment)
(LIPRI)

SUPERIOR: July 1, 1957

2047/1-10-3-32/66

S/079/61/031/004/002/006
B118/B208

158102 2209, 1372, 1407

AUTHORS: Petrov, A.A., Sopov, N.P., and Savich, I.G.

TITLE: Studies in the field of conjugate systems.
CXXXIV. "Co-dimerization" of divinyl with diisopropenyl
(Diene compounds. LXXIX)

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 4, 1961, 1140 - 1143

TEXT: Taking into account the paper by A.F. Plate and co-workers on the "co-dimerization of divinyl with cyclopentadiene (Ref. 5: Izv. AN SSSR, OKhN, 1958, 1279) which indicated a dependence of the reaction direction on the structure of dienes and on temperature, the authors of this paper studied the "co-dimerization" of divinyl with diisopropenyl. The reasons were the following: The structure of the "co-dimers" of divinyl with its homologs was determined by dehydrogenation to benzal homologs, and by oxidation of the latter with permanganate to corresponding aromatic acids. In this connection, errors were possible in the determination of the composition of the initial hydrocarbon mixture because of incomplete dehydrogenation of the individual components of the mixture, and because o-, m-,

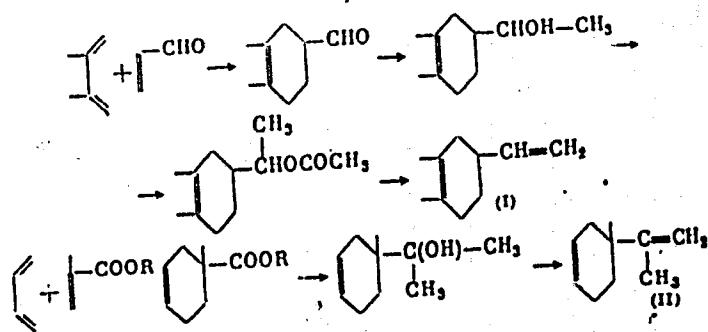
Card 1/6

2001.8

S/079/61/031/004/002/006
B118/B208

Studies in the field of conjugate ...

and p-dialkyl benzenes give aromatic acids with different yields (especially in the presence of an α -isomer). Dienes were selected on the following aspects: According to the scheme



the formation of only two dimers (I) and (II) is to be expected owing to the symmetry of dienes, which considerably facilitates the analysis of the mixture. The method previously used to confirm the structure of the re-

Card 2/6

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S/079/61/031/004/002/005
B118/B208

Studies in the field of conjugate ...

high quantities; this polymer contains the links of both hydrocarbons. The reaction presumably proceeds via a six-membered transition complex. The previous assumptions on the prevailing direction of "co-dimerization" of divinyl with diisopropenyl were thus confirmed and defined. There are 1 figure and 6 Soviet-bloc references.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut imeni Lenseveta
(Leningrad Technological Institute imeni Lenseveta)

SUBMITTED: April 29, 1960

Card 4/6

SOPOV, N.P.; KOVNER, M.L.

Preparation of hydroaromatic hydrocarbons by the pyrolysis of
acetates of secondary alcohols obtained on the basis of the
condensation product of isoprene with crotonaldehyde. Zhur. ob. khim.
33 no.4:1142-1145 Ap '63. (MIRA 16:5)

1. Leningradskiy institut aviatsionnogo priborostroyeniya.
(Hydrocarbons) (Isoprene) (Crotonaldehyde)

SOPOV, N.P.; KOVNER, M.L.

Preparation of 1,3-butadiene derivatives by pyrolysis
of secondary alcohol acetates obtained on the basis of
the condensation products of ioprene and piperylene with
unsaturated aldehydes. Zhur. ob. khim. 34 no. 5:1/92-1496
Mys '64.

ns- edenanti substituted butadiene. Ibid.:1496-
1499 (MIRA 17:7)

1. Leningradskiy institut aviationsonnogo priborostroyeniya.

SOPOV, N.P.

Production of hydroaromatic hydrocarbons by the pyrolysis of acetates of secondary alcohols obtained on the basis of the condensation product of bivinyl with crotonaldehyde. Zhur.org. khim. 1 no.2:233-236 F '65. (MIRA 18:4)

1. Leningradskiy institut aviatsionnogo priborostroyeniya.

SOTUV, Simeon

Leguminous fodder plants. Skopje (Zemjodelsko izdavatel-no predprijatije)
1950. 59 p.

4SB-205

SOPOV, S.A.

We are using a new method for ethylating gasoline. Neftianik 2
no.8:23-24 Ag '57. (MIRA 10:10)

1. Operator etilosmesitel'noy ustanovki Khabarovskogo nefteperera-
batvayushchego zavoda.
(Ethylation) (Gasoline)

SOPOV, S. I.

Paralysis

Bilateral paresis of the recurrent nerves. Vest. oto-rin., 14, No. 3, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.

SOPOV, S.I. (Smolensk).

Aneesthetic techniques in tonsillectomy (contrast anaesthesia).
Vest.oto-rin. 16 no.1:83-84 Ja-F '54.
(Anesthesia) (Tonsils--Surgery)

(MLRA 7:3)

LUK'YANOV, V.L., deputat Verkhovnogo Soveta SSSR, master bloka martenovskikh pochey; GOLIKOV, I.N.; BUY, B.I.; LEPORSKIY, V.V.; SOPOV, T. Goroy Sotsialisticheskogo Truda, val'tsovshchik; MANTSIV, R.M.; CHERNOV, V.D., stalovar

We are carrying out the decisions of the 22d Congress of the Communist Party of the Soviet Union. Metallurg 7 no.7:2-6
(MIRA 15:7)
Jl '62.

1. Nizhne-Tagil'skiy metallurgicheskiy kombinat (for Luk'yanov).
2. Direktor TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii (for Golikov). 3. Sokretar' partiynogo komiteta Makeyevskogo metallurgicheskogo zavoda (for Buy).
4. Direktor zavoda "Azovstal'" (for Leporskiy). 5. Magnitogorskiy metallurgicheskiy kombinat (for Sopov). 6. Direktor Gosudarstvennogo soyuznogo instituta po proektirovaniyu agregatov staleliteynogo i prokatnogo proizvodstva dlya chernoy metallurgii (for Mantsev).
7. Chelyabinskii metallurgicheskiy zavod (for Chernov).
(Metallurgy)

SOPOV, Ye.

New aspects in the commercial activities of "Sovexportfilm."
Vnesh. torg. 30 no.10:38-39 '60.
(Motion-picture festivals)

(MIRA 13:10)

SOPOV, Ye.

The Second Moscow International Motion Picture Festival.
(MIRA 14:7)
Vnesh. torg. 41 no.6:33-35 '61.
(Novgorod—Description) (Novgorod—Tourism)

SOPOVA, A.A.; RUNKOVA, N.V.

Problems relative to production cost. Koks i khim. no.5:59-60 '56.
(Coke industry--Costs) (MLRA 9:10)

Sopova, A.S.

C Z E C H

✓ Reaction of ethers of carbinal bases of triphenylmethane dyes with organomagnesium compounds. O. F. Ginsburg, A. S. Sopova, and E. Yu. Savchenko. *Lensovet Technol. Inst. (Leningrad)*. *Sbornik Statist. Obzirkov Akad. Nauk SSSR*, No. 1160-2 (1953).

Treatment of Me ether of crystal violet carbinal base with MeMgI (35% excess) gave crystal violet III salt; similarly Me ether of malachite green carbinal base and MeMgI gave malachite green III salt; Me ether of crystal violet carbinal base with EtMgBr gave crystal violet HBr salt, while Me ether of malachite green carbinal base and EtMgBr gave malachite green HBr salt. The reactions were run 10 hrs. at room temp., after which the mixts. were quenched in H_2O and AcOH added. To boiling soln. of 2 g. crystal violet carbinal base Me ether in $\text{Et}_2\text{O}-\text{C}_2\text{H}_5$ was slowly added 50 ml. of Et_2O soln. of MeMgI from 3.64 g. MgI_2 ; the addn. made over 4.5 hrs., followed by heating 12 hrs. gave after aq. treatment 0.81 g. (ρ - $\text{Me}_2\text{NC}_6\text{H}_4)_2\text{CMgI}$, m. 209-10° (from MeOH). Similarly PhCH_2MgCl gave (ρ - $\text{Me}_2\text{NC}_6\text{H}_4)_2\text{CCH}_2\text{PhMgCl}$, m. 180-1°. malachite green carbinal base Me ether and MeMgI similarly gave (ρ - $\text{Me}_2\text{NC}_6\text{H}_4)_2\text{CPH}_2\text{MgI}$, m. 134° (from MeOH) and (ρ - $\text{Me}_2\text{NC}_6\text{H}_4)_2\text{CPACH}_2\text{PhMgCl}$, m. 119° (from MeOH).

O. M. Kosolapoff

SOPKOVA, A. S.

"Reactions of Nitrostyrene With Compounds Containing Methylene and Methyl Groups Activated by Carbonyl and Carboxyl Groups." Cand Chem Sci, Leningrad State Pedagogical Inst, Leningrad, 1954. (ZhZhKh, No 8, Apr 55)

SO: Sun. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended At USSR Higher Educational Institutions (16).

Sopova, A.S.

USSR/ Chemistry - Reaction processes

Card 1/1 : Pub. 151 - 23/37

Authors : Perekalin, V. V., and Sopova, A. S.

Title : Reaction of nitrostyrene with certain compounds containing methylene groups activated by carbonyl and carboxyl groups

Periodical : Zhur. ob. khim. 24/3, 513-516, Mar 1954

Abstract : The reaction of omega-nitrostyrene, with substances having mobile hydrogen atoms in methylene and methyl groups, was investigated. The hydrogen atoms were activated by electrophilic (carboxyl, carbonyl) groups oriented in alpha-position or in conjugation with the methylene or methyl groups. The effect of basic catalysts on the reaction of nitrostyrene with various compounds possessing methylene groups activated by carbonyl and carboxyl groups is explained. A new method for the synthesis of gamma-amino acid derivatives was introduced. Eight references: 5-USA; 2-German and 1-USSR (1879-1949).

Institution : The A. I. Gertsen Pedagogical Institute, Leningrad

Submitted : October 23, 1953

Reaction of nitrobenzenes with some compounds containing methylene groups activated by carbonyl and carbonyl groups. V. V. Pratikova and A. S. Sopova. *J. Russ. Chem. Soc. U.S.S.R.*, 26, 522-3 (1954) (Engl. translation). — See 6-1, 10, 1056c.

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652420007-4"

SOPOVA, A.S.

3

USSR

✓ Synthesis of derivatives of γ -amino acids. V. V. Pere-

Ialin and A. S. Sopova. Doklady Akad. Nauk S.S.R. 95, 903-5(1954). Condensation of $\text{PhCH}_2\text{CHNO}_2$ with $\text{CII}(\text{CO}_2\text{Et})_2$ in dry MeOH 2 hrs. at $30-5^\circ$ gave 51.1% $\text{PhCH}(\text{CH}_2\text{NO}_2)\text{CII}(\text{CO}_2\text{Et})_2$, m. 64°. This (5 g.) in MeOH was added to 5 g. Ni catalyst (Adkins and Billica, C.A. 42, 3328c) in MeOH presatd. with H at room temp. and hydrogenation continued 6 hrs. at $30-40^\circ$ gave 97% 3-phenyl-4-carbethoxy-5-pyrrolidinone, m. 132° (from MeOH). This (3 g.) refluxed 10 hrs. with 300 ml. 18% HCl gave 75.8% $\text{H}_2\text{NCH}_2\text{CH}_2\text{CH}_2\text{CO}_2\text{H}$, m. 209° (from dil. EtOH); boiled in AcO 3 hrs. this gave the *N*-Ac analog, 70.4%, m. 65° (from hexane). O. M. Kosolapoff

AID P - 3171

Subject : USSR/Chemistry

Card 1/1 Pub. 119 - 6/8

Authors : Perekalin, V. V. and A. S. Sopova (Leningrad)

Title : Nitroolefins

Periodical : Usp. khim., 24, 5, 613-634, 1955

Abstract : The preparation of nitroolefins by nitration of aliphatic olefins and by condensation of aldehydes with primary saturated nitro compounds is reviewed. The physical and chemical properties of nitroolefins are discussed in some detail. Four tables, 158 references, 7 Russian (1873-1952).

Institution : None

Submitted : No date

AUTHORS: Perekalin, V. V. Sapozhnikov, A. S. 10-29 5-24/61

TITLE: The Synthesis of γ -Aminoketones
(Sintez γ -aminoketonov)

PERIODICAL: Zhurnal Obshchey Khimii 1958, Vol. 28, Nr 3, pp. 675-679
(USSR)

ABSTRACT: The effectively realized reaction of nitroolefines with acetic ester successfully realized by the authors offered the possibility to make use of this reaction for the elaboration of a new synthesis of γ -aminoketones. These ketones have hitherto not been investigated as there seemed to be no possible ways for their synthesis as well as no possibilities of heterocyclization forming multiple pyrrolidine derivatives of interest for chemists. It was of interest to find the dependence on their structure of the capability of condensation of unsaturated nitrocompounds with acetic ester. The reaction of nitrostyrene with acetic ester on a catalytic contact with triethylamine and pyridine led to the formation of the ethylester of the 2-acetyl - 3-phenyl - 4-nitrobutyric acid (I) (98-82%). The catalytic reduction of this ester

Card 1/3

The Synthesis of γ -Aminoketones

75-28 5-24-'61

resulted in two products, depending on the reaction period: the hydration for 10 hours only removed the nitrogroup and led to the formation of ethylesters of the 2-acetyl-3-phenyl-4-aminobutyric acid (II), that for 48 hours however, was accompanied by the saponification of the ester and the formation of 2-acetyl-3-phenyl-4-aminobutyric acid (III). The ester of the aminoketonic acid (II) was subjected to different chemical reactions: 1. The saturation of a benzene solution with dry hydrochloric furnishes the hydrochloric salt (IV). 2. The action of acetylchloride gave the acetyl derivative (V). 3. The heating with a 10% hydrochloric acid led to the solution of the basic problem: As a consequence of the ketone cleavage the γ -aminoketone-1-amino-2-phenylpentanone-4 (IV) in form of hydrochloric salt resulted with a yield of 45%. The aminoacid, in heating above the melting point, easily converted to the pyrrolidine derivative by heterocyclization; this again was converted to the hydrochloric salt of 3-phenyl-4-acetylpyrrolidin-5 (VII) by dry hydrochloric. Special attention was paid to the structure of the condensation product (I) which was to be determined. It formed in an alcohol medium with phenylhydrazine in the presence of hydrochloric acid the phenyl-

Card 2/3

The Synthesis of γ -Aminoketones

79-28 3-24/61

methylpyrazolone derivative (VIII), which is identical to the reaction product of nitrostyrene with phenylmethyl-pyrazolone; hydrazone (IX) synthetized from (I) was converted to pyrazolone (VIII) by heating in benzene in the presence of phosphorus pentoxide. Thus the structure of the condensation product of nitrostyrene with acetic ester is clearly proved.

There are 3 references, which are Soviet

ASSOCIATION: Leningradskiy pedagogicheskiy institut imeni Gertseva
(Leningrad Pedagogical Institute imeni Gertsen)

SUBMITTED: January 21, 1957

Card 3/3

ZHURAVLEVA, L.Ye.; SOPOVA, A.S. (Leningrad)

Laboratory experiments in the preparation and study of some properties of polymers. Khim. v shkole 14 no.1:54 Ja-F '59.
(MIRA 12:2)
(Polymers)

BOBOVICH, Ya.S.; PEREKALIN, V.V.; SOPOVA, A.S.

Determination of the structure of some dihydrofuran derivatives by
means of Raman spectra. Dokl. AN SSSR 134 no.5:1083-1084 O '60.
(MIRA 13:10)

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut im. A.I.
Gertseva. Predstavлено академиком А.Н.Терениным.
(Furan--Spectra)

SOPOVA, A.S.; PEREKALIN, V.V.; BOBOVICH, Ya.S.

Synthesis of dihydrofuran derivatives. Zhur.ob.khim. 31 no.5:
1528-1532 My '61. (MIRA 14:5)

1. Leningradskiy pedagogicheskiy institut imeni A.I.Gertsena.
(Furan)

SOPOVA, A.S. TEMP. I.A.

Reaction of acetoacetic ester with β -nitrostyrenes. Zhur. ob. khim.
31 no.5:1532-1534 My '61. (MIRA 14:5)

1. Leningradskiy pedagogicheskiy institut imeni A.I.Gertseva.
(Acetoacetic acid) (Styrene)

OSOKIN, Aleksandr Stepanovich; RESKOV, S.D., prof., doktor khim. nauk, retsenzent; SOPOVA, A.S., kand. khim. nauk, retsenzent; POLYANSKAYA, A.S., kand. khim. nauk, retsenzent; ALAVERDOV, Ya.G., red.; VORONINA, R.K., tekhn. red.

[Principles of general chemical technology] Osnovy obshchei khimicheskoi tekhnologii. Moskva, Vysshiaia shkola, 1963. 390 p.
(MIRA 16:7)

1. Leningradskiy pedagogicheskiy institut im. A.I.Gertsena
(for Sopova, Polyanskaya).

(Chemistry, Technical)

SOPOVA, A.S.; PEREKALIN, V.V.; YURCHENKO, O.I.

Interaction of 1-bromo-1-nitro-1-pentene and -bromo- -nitrostyrene
with some compounds containing active methylene groups. Zhur.ob.khim.
33 no.7:2140-2143 Jl '63. (MIRA 16:8)

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut imeni
A.I.Gertseva.
(Pentene) (Styrene) (Methylene group)

SOPOVA, A.S.; PEREKALIN, V.V.; LEBEDNOVA, V.M.

Interaction of 1-bromo-1-nitro-1-pentene and β -bromo- β -nitrostyrene
with active cyclic methylene components. Zhur. ob. khim. 33, no. 7:
2143-2145 Jl '63. (MIRA 16:8)

1. Leningradskiy pedagogicheskiy institut imeni A.I.Gertseva.
(Pentene) (Styrene) (Methylene group)

SOPOVA, A.S.; PEREKALIN, V.V.; LASHEDNOVA, V.M.

Interaction of α -(*p*-nitrophenyl)- β -bromo- β -nitroethylene
with some active cyclic methine and methylene components. Zaur.
ob. khim. 34 no.8:2638-2641 Ag '64. (MIRA 17:9)

1. Leningradskiy gosudarstvennyy pedagogicheskiy institut im.
Gertseva.

AVERINIKH, Anatoliy Yakovlevich; BOPOVA, Aleksandra Gennad'evna;
BAL'YAN, Kh.V., nauchn. red.; SEGAL', Z.G., ved. red.

[What can be obtained from gas] Chto poluchaiut iz gaza.
Leningrad, Nedra, 1965. 175 p. (MIRA 18:5)

SOPOVA, A.S.; YURCHENKO, O.I.; PEREKALIN, V.V.

Synthesis of nitrocyclopropanes. Zhur. org. khim. 1 no.9:
1707-1708 S '65. (MIRA 18:12)

1. Leningradskiy pedagogicheskiy institut imeni A.I. Gertseva.
Submitted May 12, 1965.

PEREKALIN, Vsevolod Vasil'yevich; Prinimali uchastiye: SOPOVA, A.V.; LERNER, O.M.; ZONIS, E.S.; ZOBACHEVA, M.M.; KVITKO, S.M.; BASKOV, Yu.V.; KAPLIN, S.V.; POLYANSKAYA, A.S.; PADVA, G.D.; ZONIS, S.A., red.; POMKINA, T.A., tekhn. red.

[Unsaturated nitro compounds] Nepredel'nye nitrosoedineniya. Lenigrad, Gos. nauchno-tekhn. izd-vo khim. lit-ry, 1961. 335 p.

(MIRA 14:7)

(Nitro compounds)

21/4974

USSR/Medicine - Tuberculosis,
Sanatoriums
Medicine - Psychology, Medicine
and Psychology

Sep/Oct 48

"The Cause of Iatrogenic Conditions in Patients
in Tuberculosis Sanatoriums," G. N. Sopova,
4t pp

"Problemy Tuberkuleza" No 5

Discusses psychology of doctor-patient relation-
ship.

LC

21/4974

SOPOVA, G. N.

Personnel of the Feodosiya Sanatorium of the Ministry of Defense
compete. Voen.-med. zhur. no.12:43-44 D '61. (MIRA 15:7)

(FEODOSIYA—SANATORIUMS)

SOPOVA, O. I.

Sopova, O. I.

"Pigment paper (a study of its basic properties and methods of improving its quality)." Min Higher Education USSR. Moscow Polygraphic Inst. Moscow, 1955. (Dissertation for the Degree of Candidate in Technical Science.)

Knizhnaya letopis'
No. 15, 1956. Moscow.

Sinyakova, O. I.

✓ Photographic paper, N. L. Sinyakov and O. I. Popova,
U.S.S.R. 103 874, Sept. 25, 1959. In the presence of photographic paper for one- or multi-colored deep printing, the emulsion is stabilized better, the photosensitive substance is more readily dissolved from the unexposed areas, and the subsequent printing is improved by heating the gelatin emulsion at 90.5° until its viscosity drops to approx. 1.5-2° Engler. M. Hirsch

BEREZIN, B.I., stv. red.; KOZAROVITSKIY, I.A., red.; MUDVEDEV,
Ivan., red.; POFONOV, A.L., red.; POMYADUKHIN, P.A., red.
SEMENOV, S.S., red.; SOLIOVA, O.I., red.

[Transactions of the Conference on the Scientific Basis
of the Processes of Printing and Methods for Their
Improvement] Trudy Konferentsii po nauchnym osnovam pro-
tsessov pechataniia i putiam ikh sovershenstvovaniia, Mo-
skva, Naukno-tekhn. ob-vo poligr. i izdatel'stv. No.1.
1961. 44 p. (MIRA 18:5)

1. Konferentsiya po nauchnym osnovam protsessov pechata-
niya i putiam ikh sovershenstvovaniya, Moscow, 1961.

ANICHKOV, N.N.; ZHABOTINSKIY, Yu.M.; ZAYKO, N.N.; SOPOVA, T.L.,;
TYSYACHNYUK, S.I.; KHLOPINA, I.D.(Leningrad)

Tissue changes following disorders of innervation. Arkh. pat. 18
no.1 3-14 '56.
(MLRA 9:6)

1. Iz otdela patologicheskoy anatomii (zav.sakad. N.N. Anichkov)
Instituta eksperimental'noy meditsiny AMN SSSR.
(NERVOUS SYSTEM, physiology,
eff. of denervation on surrounding tissue (Rus))

KRUGLOV, B.I. [Kruhlov, B.I.]; SOPOVA, Z.V.; KUSHNARENKO, G.I.
[Kushnarenko, H.I.]

Ferromolybdenum catalysts for the oxidation of methanol in
formaldehyde. Khim. prom. [Ukr.] no.3:3-8 Jl-S '63.
(MIRA 17:8)

SOPP, Laszlo, dr., tudomanyos fomunkatara

Bark percentage of the poplar. Erdö 14 no.2:66-70 P '65.

1. Scientific Institute of Forestry, Sopron.

IS K060

2074
S/020/61/139/002/014/017
B'03/B220

AUTHORS: Tepchiyev, A. V., Academician, Alaniya, V. P., and Soprano, V. A.

TITLE: Polymerization capacity and synthesis of α -furylnitro-ethylene

PERIODICAL: Akademika nakh SSSR. Doklady, v. 139, no. 2, 1961, 396-397

TEXT: When studying the problem of obtaining high-molecular compounds of the heterocyclic series containing nitro groups in the polymer chain, the authors produced α -furyl nitro-ethylene and studied its polymerization capacity. In the opinion of the authors, the following methods are of particular interest among those described in literature for the synthesis of α -furyl nitro-ethylene: (1) condensation of furfural and nitro-methane in the presence of alkalis - Ref. 1; Z. N. Nazarova, ZhKKh, no. 3, 575 (1954); B. Peib. Ber., 18, 1362 (1895); (2) condensation of furfural and nitro-methane in the presence of sodium methylate - Ref. 2; J. J. Hause, H. Linders, Leib. Ann., 362, 300 (1909); (3) synthesis of α -furyl nitro-ethylene on interaction of diketones with nitro-paraffins. Ref. 3; I. V. Perekalina, A. S. Senaya, Vestn. khim., 34, v. 5, 623 (1955). The authors synthesized α -furyl nitro-ethylene by condensation of furfural and nitro-methane in the Card 1/1

25784
S/020/61/139/002/014/017
B103/B220

Polymerization capacity and synthesis ...

and with the use of 5% of catalyst (related to the monomer). The polymers obtained are thermally stable, infusible, and unsoluble in conventional solvents. [Abstracter's note: Essentially complete translation.] There are 2 figures and 3 references: 2 Soviet-bloc and 1 non-Soviet-bloc.

SUBMITTED: March 30, 1961

Fig. 1: Yield in polymer of α -furyl nitro-ethylene in the presence of sodium methylate as catalyst, dependent on temperature (A), quantity of catalyst at optimum temperature -10°C (B), and time of polymerization. Legend: (1) quantity of catalyst; (2) time of polymerization.

Card 3/4

1. SCIRIKH, A. V., AND.
2. USSR (Sov)
4. Tanning
7. Willow bark as raw material for tanning. Leg. prom. no. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, March 1953. Unclassified.

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652420007-4

SOPRIKO, A.Ye., inzhener.

Improving the quality of a mixed, oak and willow bark extract. Leg.prom.
14 no.2:31-34 F '54. (MIRA 7:5)
(Tannins)

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652420007-4"

BARBARICH, Andrey Ivanovich; GONCHAROV, Stepan Valentinovich [Honcharov, S.V.]; KATINA, Zoya Fedorovna; SOPRIKO, Aleksandr Yemel'yanovich [Sopryko, O.O.]; KOTOV, M.I., doktor biolog.nauk, prof., otv.red.; DAKHNO, Yu.M., tekhn.red.

[Wild tannin plants of the Ukraine] Dykorostuchi dubyl'ni roslyny Ukrayny. Kyiv, Vyd-vo Akad.nauk URSR, 1961. 142 p.
(MIRA 15:5)

(Ukraine—Tanning materials)

LIVYY, G.V.; GAL'PEROVICH, M.G.; VASILYUK, N.Z.; SOPRIKO, A.Ye.i.
KAZARINA, N.I.; CHURINA, V.I.; GIL'MAN, B.A.; YEGOROV, K.A.;
GONCHAR, Ye.G.

Method of refining the skin side of fur articles made with low
grade peltry; Soviet Certificate of Inventions No.147290. Kosz.-
obuv.prom. 4 no.8:43 Ag '62. (MIRA 15:8)
(Fur industry—Technological innovations)

SOPRIKO, K.

Improvement of the quality of food must be the prime objective.
Obshchestv.pit. no.4:48 Ap '60. (MIRA 13:5)

1. Nachal'nik otdela obshchestvennogo pitaniya Kuybyshevskogo
gorodskogo Upravleniya torgovli.
(Kuybyshev--Restaurants, lunchrooms, etc.)

CHAYKIN, P.I.; SOPRINOVSKAYA, T.K.

Effect of thoron on the determination of radium emanation. Inform.
sbor. VSEGEI no.51:131-133 '61. (MIRA 15:8)
(Radium) (Thoron)

SOPRONI, Gaspar, dr.

Angiotensin skin test in the treatment of hypertension at the
district physician's office, Orv. hetil. 106 no.25:1166
20 Je '65.

1. Tiszafoldvari IV. Korzetorvosi Rendelo.

SOPRONI, Jozsef, dr. (Budapest)

Let us fight those who are damaging railroad installations!
Munka 14 no.10:9-10 O '64.

SOPHONI, János dr.

Timetable: the basis of railway transportation. Magy. vissz.
B no.4:3 15 F '6..

SOPRONI, Jozsef, dr.

Railroad workers have fulfilled the plans of the national economy. Magy vasut 7 no.19:1 0 '63.

1. Szakszervezeti titkar.

SOPRONI, Jozsef, dr.

When does a railroad work well? Magy vasut 8 no.7:3 3 Ap '64.

1. Vasutas Szakszervezet titkara.

SOPRONI, Jozsef, dr.

Five days in France; the trade-unioni congress of
railreaders. Pt. 2. Magyar Vasut 7 no.13:5 2 Jl '63.

SOPRONI, Jozsef, dr.

Report on a study tour to Sweden. Vasut 13 no.11:28-30
N°63.

1. Vasutasok Szakosztalyek titkara.

SOPRONI, Jozsef, dr.

Some methods for economical work in railroading. Munka 14
no. 6:12-13 Je '64.

IL'IN, A. (UB5PB) (Cherkassy); SOPRUN, N. (UB5YE) (Cherkassy)

Shortwave antenna stages. Radio no.4:23 Ap '65. (MIRA 18:5)

SOPRUNENKO, A. N. (Moscow)

"On the Stability of a Liquid Layer."

report presented at the First All-Union Congress on Theoretical and Applied
Mechanics, Moscow, 27 Jan - 3 Feb 1960.

SOPRILENKO, I.P. (Moskva)

Stability of the flow of a fluid layer. Izv. AN SSSR, Otd. tekh.
nauk. Mekh. i mashinostr. no. 1:142-143 Ja-F '51. (MIRA 14:2)
(Laminar flow)

S/179/62/000/002/011/012
E031/E435

16.1300
AUTHOR: Soprunenko, I.P. (Moscow)

TITLE: The boundary layer on a slightly wavy wall

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdele niye
tekhnicheskikh nauk. Mekhanika i mashinostroyeniye,
no.2, 1962, 131-133

TEXT: The case of the flow of gas along a wall whose surface has the shape of a sine wave in which the amplitude of the wave is very small by comparison with the wavelength is considered. The approximate pressure distribution is taken to be that for the potential flow of an incompressible fluid past a wavy wall. The stream function is sought in the form of a series in powers of x/λ (λ is the wavelength) with coefficients which are functions of the similarity parameter η . The boundary value problem is replaced by an initial value problem and solved by the Runge-Kutta method on the Strela computer. From the results it is easy to calculate the local friction at the wall, the drag and the stream function. The result for the friction at the wall was compared with the solution obtained when second order terms

Card 1/2

... than that of the present paper and also a smaller value of $\epsilon^0 = \epsilon_0/\delta$ (ϵ_0 is the amplitude and δ is the thickness of the boundary layer) than that obtained by H. Görtler (Z. angew. Math. Mech., no.25/27 (1947), 233-244; no.28 (1948), 13-22).

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001652420007-4

SUBMITTED: December 18, 1961

Card 2/2

ACCESSION NR: AT4006711

S/3043/63/000/002/0117/0122

AUTHOR: Paskonov, V. M.; Soprunenko, I. P.

TITLE: Boundary layer along a slightly rippled wall

SOURCE: Moscow. Universitet. Vy^zchislitel'ny^y tsentr. Sbornik rabot, no. 2, 1963. Chislennyye metody v gazovoy dinamike, 117-122

TOPIC TAGS: rippled surface boundary layer, boundary layer separation, boundary layer, boundary layer flow, flow surface structure, pressure fluctuation, laminar boundary layer, boundary layer equation, flow problem solution programming, incompressible gas flow, flow along rippled surface

ABSTRACT: The method of differences was employed to determine the values of the wave amplitude a_x at which separation of the boundary layer occurs for the first and second waves. All calculations were carried out by means of a standard computer program for solving boundary layer problems. Reference is made to a criterion for separation of a laminar boundary layer, as given by G. M. Bamin-Zelikovich (Raschet otry^yva pogranichnogo sloya. Izv. AN SSSR, otd. tekhn. nauk, No. 12, 1954). Calculation variants for this study included amplitude values of 0.01, 0.008, 0.0065, 0.005, 0.003, 0.002 and 0.001. The results obtained show that separation occurs within the range of $0.006 < a_x < 0.0065$ for the first wave and

Card 1/2

ACCESSION NR: AT4006711

0.002 < a_* < 0.003 for the second wave. The point of separation (X sep.) for amplitudes of 0.01, 0.008, 0.0065, 0.006 and 0.003, respectively, was 0.4775, 0.5125, 0.6925, 1.45 and 1.54, the first 3 values pertaining to the first wave and the last 2 to the second wave. Orig. art. has: 3 graphs, 6 formulas and 1 table.

ASSOCIATION: Vychislitel'nyy tsentr MGU (Computer center, Moscow State University)

SUBMITTED: 00

DATE ACQ: 16Dec63

ENCL: 00

SUB CODE: AI, PH

NO REF Sov: 004

OTHER: 000

Card

2/2

"APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652420007-4

SOPRUCHENKO, I.P. (Moskva)

Stability of jet flows. Inv. AN SSSR Mekh. no.4:31-3
Jl-Ag '65. (MIRA 18:12)

APPROVED FOR RELEASE: 08/25/2000

CIA-RDP86-00513R001652420007-4"

L 23472-65 EWT(1)/EWP(m)/FCS(k)/EWA(1) Pd-1/Pi-4

ACCESSION NR: AP5002602

S/0179/64/000/005/0137/0139

AUTHOR: Soprunenko, I. P. (Moscow)

TITLE: Stability calculation of boundary layer flow with a positive pressure gradient

SOURCE: AN SSSR. Izvestiya. Mekhanika i mashinostroyeniya, no. 5, 1964, 137-139

TOPIC TAGS: flow stability, boundary layer, velocity profile, laminar flow, Reynolds number, boundary layer instability, pressure gradient

ABSTRACT: The stability of one-parameter velocity profiles in a boundary layer with linearly decreasing external flow velocity $U(z) = b_0(1-z)$ is considered. The analysis is limited to the vicinity of the separation point $x = 0.125$, and covers velocity profiles in the range $x = 0.0375$ to $x = 0.125$. The Orr-Sommerfeld equation for the perturbation amplitude Φ is given

$$(u - c)(\Phi' - a^4\Phi) - u''\Phi = -\frac{i}{aR}(\Phi^{IV} - 2a^4\Phi' + a^6\Phi)$$
$$(c = c_r + i\omega, \quad a = 2\pi/\lambda, \quad R = 2\gamma b_0 X/v)$$

and the solution is formulated as follows: a closed form solution is obtained from

Card 1/2

L 23472-65

ACCESSION NR: AP5002602

outside the boundary layer and a numerical solution from inside the boundary layer. The two are then joined from α , R, and c_p considerations. Instead of solving the boundary value problem, Ψ is represented as the sum of four fundamental solutions of a linear system with four arbitrary constants determined from a set of initial conditions on Ψ . The results are presented graphically, as α versus R and as c_p versus R, for $0.0375 \leq x \leq 0.175$ at intervals of 0.0125. The c_p^* are found to be constant for profiles up to separation ($c_p^* = 0.42$) but decrease thereafter. Comparing these results with those of H. Schlichting (Über die theoretische Berechnung der kritischen Reynoldschen Zahl einer Reibungsschicht in beschleuniger und verzögter Strömung. Jb. d. dt. Luftfahrtorschung, 1940, 1. p. 97), it is found that the relative disagreement between the two results is 29 % for $x = 0.075$ and 12% for $x = 0.05$. O. F. Khodykina participated in the computer calculations. Orig. art. has: 5 formulas, 4 figures, and 2 tables.

ASSOCIATION: none

SUBMITTED: 02Mar64

ENCL: 00

SUB CODE: HE

NO REF Sov: 000

OTHER: 004

Card 2/2

L 33379-66
ACC NR: AT6010594

SOURCE CODE: UR/2582/65/000/015/0117/0134

AUTHOR: Soprinenko, Ye. P. (Moscow)

49
B+1

ORG: None

TITLE: Minimal realization of certain functions by circuits made up of functional elements

SOURCE: Problemy kibernetiki, no. 15, 1965, 117-134

TOPIC TAGS: cybernetics, switching theory, switching circuit, algebraic logic

ABSTRACT: The author studies the realization of the conjunction $x_1x_2\dots x_r$ and the disjunction $x_1 \vee x_2 \vee \dots \vee x_r$ by functional element circuits in the base consisting of single function—the Scheffer stroke. It is assumed that $L(r)$ is the minimal number of elements necessary for realizing the conjunction $x_1x_2\dots x_r$, and $L'(r)$ is the minimal number of elements necessary for realizing the disjunction $x_1 \vee x_2 \vee \dots \vee x_r$. The results of this study are given by the following expression.

$$L(r) = 2(r-1)$$

$$L'(r) = 3(r-1)$$

The author thanks O. B. Lupanov for supervision and V. B. Kudryavtsev for advice. Orig.
art. has: 11 figures, and 7 formulas.
SUB CODE: 09,12/ SUBM DATE: 24Mar63/ ORIG REF: 003/ OTH REF: 001
Card 1/1 JS

SOPRUNOV, F. F.

PL 16 T28

USSR/Medicine - Fungi
Medicine - Parasitology

Feb 1947

"The Destruction of Infectious Nematode Larvae by
Means of Soil Fungi (Review)," F. F. Soprunov,
Turkmen Institute of Malaria and Medicinal
Parasitology, 5 pp

"Meditinskaya Parazitologiya" Vol XVI, No 2

Discusses the different types of fungi and conditions
of propagation, the mechanics of destroying
nematodes with fungi, experience with the use of
fungi in combatting nematodes in human beings and in
domestic animals.

The Director of the Institute is S. A. Promikov. 16T28

1. SOFRUNOV, F. F.
2. USSR (600)
7. "Concerning the Question of What Genus the Carnivorous Hyphomycetes from Turkmenistan Soil Belong To", Izvestiya Turkm. Filiala Akad. Nauk SSR (News of the Turkmenistan Affiliate, Acad Sci USSR), No 5, 1950, pp 88-90.
9. Mikrobiologiya, Vol XXI, Issue 1, Moscow, Jan-Feb 1952 pp 121-132, Unclassified.

...

Hemoglobin

Accelerated method for determining the average haemoglobin content of blood during widespread tests. Izv. Tark. fil. AN SSSR No. 1, 1951.

Monthly List of Russian Accessions, Library of Congress, June 1953. Unci.

GALYULINA, Z. A. ; SOPRUNOV, F.E.

Hyphomycetes

Carnivorous hyphomycetes from the soil of Turkmenistan., Mikrobiologiya, 20, no. 6, 1951.

Monthly List of Russian Accessions, Library of Congress, March 1952. UNCLASSIFIED.

SOPRUNOV, F.F.

Hyphomycetes

Helminthophage in carnivorous soil Hyphomycetes in Turkmenistan., Dokl. AN SSSR, 81, №5
1951.

Institut Malyarii I Meditsinskoy Parazitologii Turkmenskoy SSR rcd. 1st Aug. 1951

SO: Monthly List of Russian Accessions, Library of Congress, May 1952 1951, Uncl.

SOPRUNOV, F.F.; DURSHNOVA, S.M.

Some peculiarities of the structure of the dorsal lobe of the sexual bursa
of males of Ancylostoma duodenale D. Izv. AN Turk.SSR no.1:80-82 '52.
(MLRA 6:8)

1. Institut malyarii i medparazitologii Ministerstva zdravookhranenia
Turkmenskoy SSR.
(Hookworms)